

WHAT IS CLAIMED IS:

1                   1.       In a digital signal processor (DSP), a method for motion detection  
2   in a current frame of video information, comprising:  
3                   providing a search window which defines a search area of data points of  
4   said current frame, said search window defining a pattern of search points located in said  
5   current frame;  
6                   loading a reference block into a first memory portion of said DSP;  
7                   loading at least a first frame portion of said search area into a second  
8   memory portion of said DSP, said first frame portion including at least some of said  
9   search points;  
10                  determining a first level search point including performing comparisons of  
11   said reference block with search points in said first frame portion;  
12                  selectively loading a second frame portion of said search area into a third  
13   memory portion of said DSP based on a location of said first level search point; and  
14                  performing a local search relative to said first level search point.

1                   2.       The method of claim 1 wherein said determining further includes  
2   performing a comparison of said reference block with at least one search point that is  
3   stored in a memory that is external to said DSP.

1                   3.       The method of claim 1 wherein said local search includes  
2   providing a second search window centered about said first level search point, said  
3   second search window defining a refined search area contained within said search area of  
4   said current frame.

1                   4.       The method of claim 3 wherein said loading a second frame  
2   portion is performed if said refined search area includes data points not contained in said  
3   first frame portion.

1                   5.       The method of claim 1 wherein the first, second, and third memory  
2   portions are portions of an on-chip memory of said DSP.

1                   6.       The method of claim 1 wherein said third memory portion is  
2   contained within said second memory portion.

1                   7.       The method of claim 1 wherein said performing comparisons  
2 includes producing motion vectors.

1                   8.       The method of claim 7 wherein said first level search point is  
2 determined based on said motion vectors.

1                   9.       The method of claim 1 wherein said performing comparisons  
2 include calculating sum of absolute difference values.

1                   10.      The method of claim 1 wherein the entirety of said search area is  
2 loaded into said second memory portion.

1                   11.      A method for video compression by comparing a first frame of  
2 video information against a second frame of video information, comprising:  
3                   identifying a reference frame contained in said first frame;  
4                   storing said second frame in a first memory;  
5                   defining a search area in said second frame, said search area comprising  
6 data points in said second frame, said search area including plural search points;  
7                   storing at least a portion of said search area into a second memory,  
8 including one or more of said search points;  
9                   comparing said reference block to search points contained in said second  
10 memory;  
11                  determining a first level search point based at least on said step of  
12 comparing;  
13                  defining a refined search area centered about said first level search point,  
14 said refined search area being contained in said search area; and  
15                  performing a local search on said refined search area.

1                   12.      The method of claim 11 wherein said performing a local search  
2 includes selectively loading data comprising said refined search area into said second  
3 memory.

1                   13.      The method of claim 12 wherein said step of selectively loading  
2 data is performed if said refined search area includes locations not contained in said first  
3 frame portion.

1                   14.     The method of claim 11 further including an additional step of  
2 comparing said reference block to search points which are contained in said first memory  
3 and which are not contained in said second memory, said determining further based on  
4 said additional step of comparing.

1                   15.     The method of claim 11 wherein said steps are performed in a  
2 digital signal processor.

1                   16.     The method of claim 15 wherein said first memory is external to  
2 said digital signal processor and said second memory is an on-chip memory contained in  
3 said digital signal processor.

1                   17.     The method of claim 11 wherein said comparing includes  
2 producing motions vectors and said first level search point is determined based on said  
3 motion vectors.

1                   18.     The method of claim 11 wherein said comparing includes  
2 calculating sum of absolute difference values.

1                   19.     The method of claim 11 wherein the entirety of said search area is  
2 stored in said second memory.

1                   20.     In a digital video image compression system, a device for  
2 estimating motion, comprising:  
3                   a processor;  
4                   a first memory coupled to said processor for storing a current frame; and  
5                   a second memory coupled to said processor, wherein said second memory  
6 stores a sequence of instructions which, when executed by said processor, cause said  
7 processor to perform steps of:

8                   (i) accessing a search window which defines a search area in said current  
9 frame, said search window defining a pattern of search points in said current frame;  
10                  (ii) loading a reference block into a first memory portion of said DSP;  
11                  (iii) loading at least a first frame portion of said search area into a second  
12 memory portion of said DSP, said first frame portion including at least some of said  
13 search points;

14 (iv) determining a first level search point including performing  
15 comparisons of said reference block with search points in said first frame portion;  
16 (v) selectively loading a second frame portion of said search area into a  
17 third memory portion of said DSP based on the location of said first level search point;  
18 and  
19 (vi) performing a local search about said first level search point.

1 21. The device of claim 20 said first memory is external to said DSP.

1 22. The device of claim 21 said second memory is on-chip memory  
2 contained in said DSP.

1 23. The device of claim 20 wherein said step (iv) further includes  
2 performing a comparison of said reference block with at least one search point that is  
3 stored in said first memory.

1 24. The device of claim 23 said first memory is external to said DSP.

1 25. The device of claim 20 wherein said performing comparisons  
2 includes producing motion vectors and said first level search point is determined based on  
3 said motion vectors.